

Environmental Beliefs among Jeju Women in South Korea: An Analysis of Survey Data

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ABSTRACT

The paper examined empirically environmental beliefs among Jeju women in South Korea by analyzing survey data collected in 1999. The findings indicate that 58 per cent of Jeju women held pro-environmental beliefs that were measured with the Revised New Ecological Paradigm Scale. Environmental beliefs being structured with four dimensions in the mind of Jeju women educational attainment proved a significant determinant for the two belief dimensions: *human's excessive involvement in nature* and *human superiority over nature*. Those with higher educational attainment agreed strongly with the belief in human's excessive involvement in nature whereas rejecting the belief in human superiority over nature.

1. Introduction

The paper aims to examine empirically how environmental beliefs are structured among Jeju women in South Korea (hereafter Korea) using a sample survey data collected in 1999. It analyzes a response pattern to the items of the Revised Ecological Paradigm Scale which is used as a measure of environmental belief (Dunlap et al. 2000). In this study environmental belief is considered reflecting the affective aspect of environmental concern; and it is defined as a basic belief structure that concerns the way of seeing the natural environment. Therefore, it can be inferred that every society has its own system of beliefs that defines what the natural environment is, and, what it should be. These can be further affected by much broader cultural

belief systems in society (Chang 2004).

Jeju island presented as a research site in this study suggests interesting points for the study of environmental belief. The island has seen great transformation in her social recognitions among Korean publics and politicians alike in the early 21st century. This newly emerging recognition can be read as a reflection of the postindustrial transition in the Korean economy structure from the 1990s onwards. When Korean economy transformed from agriculture to manufacturing industry in the late 1960s Jeju was isolated from the project because of the ecological cost that the geographical characters of the island present. This has made the island remained poor; on the other hand the natural condition of the island has been well preserved compared to the regions that hosted the manufacturing industry bases. This

economically poor but environmentally healthy condition of the island has encountered with the postindustrial transition that involves the production of information and high technology and the consumption of sophisticated technology based consumer products such as smartphones, digital cameras, and laptops. While the regions that were of success hosting manufacturing factories have accumulated significant amount of wealth they are suffering negative environmental impact caused by the unclean mechanism of the economic production. In addition, the advancement in communication technology (notably the popularity of the Internet among Koreans in everyday life) and transportation technology (with significant increase in traffic between the major regions in the mainland and the island) has turned Jeju island easy to access and attractive for those suffering urban fatigue driven from city life. In this context the island is now considered as an eco-paradise and a treasure island.

However, although the island has been newly defined as an eco-paradise few researches are undertaken to understand ecological orientations of the islanders. The paper aims to fill the gap in our understanding on the issue by examining environmental belief systems among female residents that concern the relationship between the natural environment and humans. In examining Jeju women's environmental belief the paper analyzes a response pattern to the items of the Revised Ecological Paradigm Scale (hereafter, the Revised NEP Scale) and identifies empirical dimensional structures within the mind of Jeju women employing factor analytical method. It further examines significant social locational variables (among social class, educational attainment, household income and age) that determine the difference in environmental

beliefs among women in Jeju island.

The paper is divided into four parts. The second part introduces data for the study and empirical measures of the variables – environmental belief and social locational variables. The third reports findings of the study and the fourth part discusses the implication of the findings.

2. Data and Methods

2.1. Data

The data for this study are derived from the “collaborative project on Consumerism and Sustainable Development between Australia and Korea”. A sample survey for Korean study was conducted in 1999 focusing upon Jeju. The survey was conducted by means of a face-to-face personal interview. 485 female samples were selected randomly from households which were initially randomly chosen.

2.2. The Measurement and Operationalization of Variables

Environmental Belief This study will make use of the Revised NEP scale (Dunlap et al. 2000) for measuring environmental belief, using a five-point scale ranging from ‘strongly agree’ to ‘strongly disagree’. The 15 items are listed below.

1. The balance of nature is very delicate and easily upset.
2. Humans have the right to rule over the rest of nature.
3. The earth is like a spaceship with only limited room and resources.
4. Humans have the right to modify the

- environment to suit their needs.
5. When human interfere with nature it often produces disastrous consequences.
 6. We are approaching the limit of the number of people the earth can support.
 7. Humans are severely abusing the environment.
 8. Human ingenuity will ensure that we do not make the earth unliveable.
 9. The earth has plenty of natural resources if we just learn how to develop them.
 10. Plants and animals have as much right as humans to exist.
 11. The balance of nature is strong enough to cope with the impacts of modern industrial nations.
 12. Despite our special abilities humans are still subject to the laws of nature.
 13. The so-called “ecological crisis” facing humankind has been greatly exaggerated.
 14. Human will eventually learn enough about how nature works to be able to control it.
 15. If things continue on their present course, we will soon experience a major ecological catastrophe.

This is an updated version of the New Environmental Paradigm Scale developed in 1978 (Dunlap and Catton). The original NEP scale consists of 12 items and has a five-point scale range from ‘strongly agree’ to ‘strongly disagree’. The reasons for developing the revised scale were two-fold: first, since the original scale was constructed, the changing environmental situation – particularly the appearance of global environmental problems and the rise of human-exemptionalism – meant a further set of items was necessary. The second reason is methodological, and involves modifying outmoded termi-

nology (e.g. mankind) plus including an “unsure” category as a midpoint to cut down on items of no response (Dunlap et al. 2000).

A factor analytic technique will be applied to the responses on the 15 items for extracting the basic dimensions of environmental belief. As Dunlap et. al. (2000) has done, this study will use the principal-factor method with the eigenvalue-one criterion, employing the varimax rotation technique.

The principal factor method is superior to others in terms of parsimonious reduction of the data matrix. The principle of eigenvalue-one criterion suggests that the factors having an eigenvalue greater than unity (1.000) are considered as common factors. The factors with less than 1.000 eigenvalue indicates that their explanatory power is less than one variable. Varimax rotation improves the simple structure of factors and results in a clearer demarcation in the underlying domain of variables than the unrotated factor structures. Then, the dimensions of environmental belief that will be extracted from the factor analytic technique specified above will be examined in terms of this explanatory power as sub-categories of environmental belief on the basis of their eigenvalues. Additionally, the composite items representing their empirical meaning can be compared with the five theoretical ones – the fragility of nature’s balance, anti-anthropocentrism, the reality of limits to growth, possibility of an eco-crisis, and rejection of human exemptionalism. Also, the relative importance of each item as a component of environmental belief will be examined on the basis of their communality.

Social Locational Variables Four social locational variables are used in order to determine their effects upon environmental belief dimensions: social class, educational attainment, house-

hold income, and age.

For the measure of social class Erik Wright's model (1985) will be adopted as it is based on the concept of the capitalist mode of production in the process of industrialization, and many environmental sociologists have emphasised the capitalist mode of production as the main cause of environmental problems (e.g. Cotgrove 1982; Milbrath 1989). Wright's class locations of bourgeoisie, small employer, petty bourgeoisie, manager and supervisor, semi-autonomous employee, and proletariat will provide contradictory of the class scheme. The operationalisation of this scheme will follow from Wright (1985), as follows: 1/ employers are divided into two groups, bourgeoisie who employ two or more workers; petty bourgeoisie who employ one or no workers; 2/workers are grouped into three categories: managers and supervisors are those in a position of management or supervision over other employees; experts, those who work autonomously with high skill levels; proletariat, those who have no managerial or supervisory responsibilities and do not control their own work situation.

Educational attainment was measured by the degree completed. It has categories ranging from primary school or less to postgraduate degree. Household income was measured on an 18 paid scale from negative income to \$ 2,000 or more per week – 103,950 or more per year – before tax. Actual age was registered and then rescaled into age cohorts. These are: 18-29 years; 30-39 years; 40-49 years; 50-59 years; 60 and more.

3. Findings

3.1. Frequency distributions of the NEP

items

Responses to the 15 items of the Revised NEP Scale are listed in Table 1. The items of the Scale are listed together under the theoretically driven dimensions of : the fragility of nature's balance; anti-anthropocentrism; the reality of limits to growth; possibility of an eco-crisis; and rejection of human exemptionalism.

From the Table, environmental beliefs are observed as prevalent in the sample of Jeju women. By summing the percentages of 'strongly agree' and 'agree' for the pro-environmental belief items and the percentages of 'strongly disagree' and 'disagree' for the anti-environmental belief items, it is found that 58 per cent of Jeju women accept the notions of the New Ecological Paradigm overall. However, 16 per cent of the respondents are unsure as to whether to agree or not across the range of items. This finding corresponds to that of Dunlap et al. (2000: 433) where it was found that 67 per cent of the respondents accepted the ideas of New Environmental Paradigm, while 11 per cent were 'Unsure' (mid point response)¹). Our finding is equivalent with that of previous research that found that the endorsement of the NEP was high among the public, irrespective of level of economic development and cultural differences (e.g. Chung and Poon 2001; Corral Verdugo and

1) Our wording for a five-point Likert scale is to some extent different from that used by Dunlap et al. (2000). As shown in Table 1, the Mid point answer is Neither Agree Nor Disagree, for which Dunlap et al. used the term Unsure. In addition to the five points scales, we allowed two other options for the response, that is, Don't Know, and Refused. Rather than incorporating the two categories, they were excluded for the analysis (They amounted to 10 per cent of the respondents).

Armendariz 2000; Dunlap and Van Liere 1978).

However, as the mean scores directly show with a range of 2.22 to 4.28, a considerable gap is found in the level of endorsement of the 15 items. While most of the items received

more than 50 per cent support, items 4, 8, 9, 12, 13, 14 received less than 50 per cent support among the sample of Jeju women. In particular, only 12 per cent of Jeju women sample disagreed with the statement (Item 14)

Table 1 Frequency Distribution of the New Ecological Paradigm Scale Items (per cent)

<i>Please indicate how much you agree or disagree that:</i>	<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Neither Agree Nor Disagree</i>	<i>Agree</i>	<i>Strongly Agree</i>	<i>Mean</i>
<i>The Fragility of Nature's Balance</i>						
1. The balance of nature is very delicate and easily upset	3.9	10.6	14.1	34.4	37.0	3.90
5. When humans interfere with nature it often produces disastrous consequences	3.8	7.3	10.6	49.1	29.2	3.93
11. The balance of nature is strong enough to cope with the impacts of modern industrial nations (R)	25.8	37.3	16.9	14.4	5.6	3.63
<i>Anti-Anthropocentrism</i>						
2. Humans have the right to rule over the rest of nature (R)	30.0	25.9	11.8	22.7	9.6	3.44
4. Humans have the right to modify the environment to suit their needs (R)	13.7	24.3	16.0	32.3	13.7	2.92
10. Plants and animals have just as much right as humans to exist	1.5	3.2	10.3	39.4	45.7	4.25
<i>The Reality of Limits to Growth</i>						
3. The earth is like a spaceship with only limited room and resources	2.5	9.7	15.8	39.5	32.5	3.90
6. We are approaching the limit to the number of people the earth can support	2.8	12.8	15.4	43.1	25.9	3.77
9. The earth has plenty of natural resources if we just learn how to develop them (R)	11.7	31.1	18.0	27.0	12.2	3.03
<i>Possibility of an Eco-Crisis</i>						
7. Humans are severely abusing the environment	1.1	4.9	8.9	35.7	49.6	4.28
13. The so-called ecological crisis facing humankind has been greatly exaggerated (R)	13.2	33.4	23.2	23.0	7.3	3.22
15. If things continue on their present course, we will soon experience a major ecological catastrophe	3.1	7.5	11.7	37.2	40.5	4.04
<i>Rejection of Human Exemptionalism</i>						
8. Human ingenuity will ensure that we do NOT make the earth unliveable (R)	8.9	24.4	18.7	32.8	15.3	2.79
12. Despite our special abilities, humans are still subject to the laws of nature	10.4	26.3	24.5	27.4	11.5	3.03
14. Human will eventually learn enough about how nature works to be able to control it (R)	3.7	8.6	20.4	40.2	27.0	2.22
Total percentages of the acceptance of the NEP	57.98					

Note: Those items whose statements are worded negatively for pro-environmental beliefs are reworded and indicated in a bracket as R.

that *Human will eventually learn enough about how nature works to be able to control it.*

3.2. Empirical dimensions of environmental belief

The original NEP scale has raised the dimensionality issue as to whether all the items together represent a single conceptual reality, so called 'the New Ecological (Environmental) Paradigm'. In order to determine the dimensionality of the Revised NEP Scale as an indicator of environmental belief, a varimax rotation of a principle component analysis with the eigenvalue of 1.0 was undertaken. Table 2 presents the results of factor analysis for environmental belief of Jeju women.

As is shown in Table 2, from the initial rotation, four factors were extracted from the sample of Jeju women. It is usual to employ

a factor loading of 0.30 as the criterion for determining the significant components of each factor. However, as can be identified in Table 2, when a factor loading 0.30 is employed some items are loaded on two and more factors. For such a case, an arbitrary factor loading is employed in a way that each item is loaded on only one factor as its significant component. Since with the factor loading of .40, Item 11 equally contributes to the two factors, a factor loading of 0.50 was decided as a criterion to determine the significant component of each factor.

From the final set of factor structure based on the factor loading of 0.50 and over, it is found that item 11 is not loaded in any of the factors. This tells us that Item 11 is not significantly correlated with other items in terms of being clustered as a whole of environmental belief. While Dunlap et al. (2000) pro-

Table 2 Factor Structures for the New Ecological Paradigm Scale Items

NEP ITEMS*	1 st Rotation			
	1	2	3	4
NEP 1 (Nature's Balance)	.27	.05	.51	-.07
NEP 2 (Anthropocentrism)	-.09	.01	-.22	.79
NEP 3 (Limits to Growth)	.05	-.06	.67	.04
NEP 4 (Anthropocentrism)	-.11	.31	.19	.72
NEP 5 (Nature's Balance)	.76	-.18	-.09	.07
NEP 6 (Limit to Growth)	.53	.10	.21	-.18
NEP 7 (Eco-Crisis)	.67	.07	.26	-.18
NEP 8 (Human-Exemptionalism)	.10	.62	-.07	.06
NEP 9 (Rejection to Limits to Growth)	-.13	.66	.03	.05
NEP 10 (Anti-Anthropocentrism)	.56	.01	-.09	-.07
NEP 11 (Refusal to Nature's Balance)	-.00	.47	-.48	.19
NEP 12 (Refusal to Human Exemptionalism)	.12	.56	-.35	.01
NEP 13 (Refusal to Eco-Crisis)	-.14	.64	-.03	.11
NEP 14 (Human-Exemptionalism)	.18	.56	.31	-.01
NEP 15 (Eco-Crisis)	.65	.02	.28	.06
Eigen value	2.74	2.28	1.17	1.04
Percentage of variance	18.25	15.19	7.78	6.93

Note: Items loaded over .50 and above were chosen and bold marked.

* Conceptual facets in the brackets are presented reflecting the way each item is originally stated.

duced the same number of factors with ours, no item was lost with the factor loading of .50. It was reported that the original 12 item NEP Scale are structured with two (Noe and Snow 1990), three (Albrecht et al. 1982; Furman 1998), and four factors, while shorten version of the six items with two factors (Gooch 1995; Rauwald and Moore 2002).

The explanatory power of the 15 items from Table 2 is worthwhile to mention. As total percentage of variance indicates, they explain 48.15 per cent of the sample of Jeju women. While most of the NEP research have not shown an interest in the explanatory power of NEP Scales, our result is observed slightly less than Dunlap et al (2000; 56.6 per cent), Sweden (Gooch 1995; 57.5 per cent), but similar with Latvia, and Estonia (Gooch, 1995; 49.7 per cent, 50.6 per cent, respectively).

Furthermore, each factor has a different level of explanatory power. The first two of the sample factors have five, and the second two factors have two items loaded. Also, the first two Korean factors have almost similar explanatory power with first one enjoying slightly higher, and, as such, for the last two factors. They are summarized in Table 3.

3.3. Social locational determinants of environmental beliefs

Multiple regression analysis was used to identify significant determinants of environmental beliefs among the social locational variables. Household income, age, and education were entered into the equation as continuous variables, while social class was treated as a dummy variable. Table 4 provides the results of this

Table 3 The Component Items of Each Factor and Its Labels

Factors	Items loaded	Factor labels
1	5, 6, 7, 10, 15	Human's Excessive Involvement in Nature
2	8, 9, 12, 13, 14	Human Superiority over Nature
3	1, 3	Nature's Fragility and Limit
4	2, 4	Human Right over Nature

Note: Item numbers correspond to the ones in Table 1.

Table 4 Social Locational Determinants of the Empirical Dimensions of Environmental Belief

Independent Variables	D1	D2	D3	D4
Social class (<i>Proletariat is the reference category</i>)				
Employers	-.004	.101	-.089	-.045
Petty bourgeoisies	.055	.102	-.080	.017
Experts	.026	.094	-.069	-.010
Non-expert managers and supervisors	.067	.057	-.048	-.051
Unpaid workers in family business/farm	-.033	-.022	-.103	-.073
Household income	-.046	.066	.020	-.025
Education	.128**	-.257***	.111	-.072
Age	-.069	-.054	-.058	.083
R ²	.039	.062	.041	.024

Note: D1=Human's Excessive Involvement in Nature; D2=Human Superiority over Nature; D3=Nature's Fragility and Limit; D4=Human Right over Nature.

* p < .05; ** p < .01; *** p < .001.

analysis.

What is identified from Table 4 is that educational attainment only determines positively 'human excessive involvement in nature', and negatively 'human superiority over nature'. However, the remaining dimensions of environmental beliefs – nature's fragility and limit, human right over nature – are not determined by educational attainment. On the other hand, social class, household income, and age do not influence any of the environmental beliefs. Overall, as can be identified from R squares in Table 4, the explanatory power of the social locational variables for environmental beliefs is low, ranging from 2.4 per cent (human right over nature) to 6.2 per cent (human superiority over nature).

4. Discussion

The paper was aimed at knowing the patterns of environmental beliefs among Jeju women in Korea. For an empirical examination it analyzed a survey data collected in 1999. The findings indicated that 58 per cent of Jeju women held pro-environmental beliefs that were measured with the Revised New Ecological Paradigm Scale. Environmental beliefs being structured with four dimensions in the mind of Jeju women educational attainment proved a significant determinant for the two dimensions: human's excessive involvement in nature; and human superiority over nature. Those with higher educational attainment agreed strongly with the belief in human's excessive involvement in nature whereas rejecting the belief in human superiority over nature.

This research indicated that the beliefs in human's excessive involvement in nature and

human superiority over nature can be of yardsticks to discern the ecological orientation among publics. It will be sufficient for researchers to employ these two dimensions only because these two are what makes people divide acute in their opinions. Also it is affirmed that educational attainment can make people to be critical of the status quo belief such as continuous economic growth. This finding suggests that environmental education can play a significant role to socialize people ecologically friendly way.

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